

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 27060	FOR FURTHER ACTION <small>see Form PCT/ISA/220 as well as, where applicable, item 5 below.</small>	
International application No. PCT/IL04/00047	International filing date (<i>day/month/year</i>) 15 January 2004 (15.01.2004)	(Earliest) Priority Date (<i>day/month/year</i>) 16 January 2003 (16.01.2003)
Applicant BIO-OZ ADVANCED BIOTECHNOLOGICAL AGRICULTURE LTD.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☒ Certain claims were found unsearchable (See Box No. II)

3. ☒ Unity of invention is lacking (See Box No. III)

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the drawings to be published with the abstract is Figure No. _____



as suggested by the applicant.



as selected by this Authority, because the applicant failed to suggest a figure.



as selected by this Authority, because this figure better characterizes the invention.

b. ☒ none of the figures is to be published with the abstract.

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 22-25
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Claims 22-25 were unsearchable because they attempt to limit a method of previous claim 21. However, claim 21 is directed to a product, not a method.
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
 2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
 3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
 4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-5
- Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-5, drawn to a first method, of enhancing expression of an exogenous polynucleotide sequence in a plant, comprising administering to the plant a virus selected capable of suppressing gene silencing in said plant.

Group II, claim(s) 6-11, drawn to a second method, of identifying a gene silencing agent.

Group III, claim(s) 12-20, drawn to a third method, of producing a molecule of interest.

Group IV, claim(s) 21, drawn to a first product, an article of manufacturing comprising a container including a virus selected capable of suppressing gene silencing in a plant and a packaging material.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature of Group I is the administration of a virus, capable of suppressing gene silencing in a plant, to that plant, wherein the plant comprises an exogenous polynucleotide sequence, wherein said administration enhances expression of said polynucleotide sequence. The special technical feature of Group II is the identification of a virus capable of suppressing gene silencing in a plant; the special technical feature Group III is administration of a virus capable of suppressing gene silencing to any plant, including those that do not comprise and exogenous nucleotide sequence, and extracting any molecule of interest from the plant; the special technical feature of Group IV is a virus capable of suppressing gene silencing in a plant.

However, the prior art teaches the enhancement of expression of an exogenous polynucleotide sequence in a plant, by administration of a virus that suppresses gene silencing. Brignetti et al. (Viral Pathogenicity Determinants are Suppressors of Transgene Silencing in *Nicotiana benthamiana*. EMBO J. 1998, Vol. 17, No. 22, pages 6739-6746, see pages 6739-6743) teach the expression of green fluorescent protein (GFP) in plants following inoculation of potato virus Y (PVY) or cucumber mosaic virus (CMV), wherein GFP was silenced in the plant prior to viral inoculation. These viruses were shown to contain suppressors of gene silencing. Therefore this special technical feature of the groups is not a contribution over the prior art.

Claims 22-25 are unsearchable, because they attempt to limit a method of previous claim 21. However, claim 21 is directed to a product, not a method.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12N 15/82, 15/83, 15/87, 15/90

US CL : 800/278, 285, 286

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 800/278, 285, 286

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WEST, Agricola, CAPlus, Biosis

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	VOINNET et al. Suppression of Gene Silencing: A General Strategy Used by Diverse DNA and RNA Viruses of Plants. PNAS. 23 November 1999, Vol. 96, No. 24, pages 14147-14152, see whole document.	1, 2, 4
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Y		3, 5
A	MALLORY et al. The Amplicon-Plus System for High-Level Expression of Transgenes in Plants. Nature Biotech. June 2002, Vol. 20, pages 622-625, see whole document	1-5
A	MARATHE et al. RNA Viruses as Inducers, Suppressors, and Targets of Post-Transcriptional Gene Silencing. Plant Mol. Biol. 2000, Vol. 43, pages 295-306.	1-5
Y	GAL-ON et al. Particle Bombardment Drastically Increases the Infectivity of Cloned DNA of Zucchini Yellow Mosaic Potyvirus. J. Gen. Virol. 1995, Vol. 76, pages 3223-3227, see whole document.	5
Y	KARASAWA et al. One Amino Acid Change in Cucumber Mosaic Virus RNA Polymerase Determines Virulent/Avirulent Phenotypes on Cowpea. Phtopath. 1999, Vol. 89, No. 12, pages 1186-1192, see pages 1186-1191.	3



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

16 March 2005 (16.03.2005)

Date of mailing of the international search report

02 MAY 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Ashwin Mehta

Telephone No. 571-272-1600

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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	BRIGNETI et al. Viral Pathogenicity Determinants are Suppressors of Transgene Silencing in Nicotiana Benthamiana. EMBO J. 1998, Vol. 17, No. 22, pages 6739-6746, see whole document.	1, 2, 4 ----- 3, 5